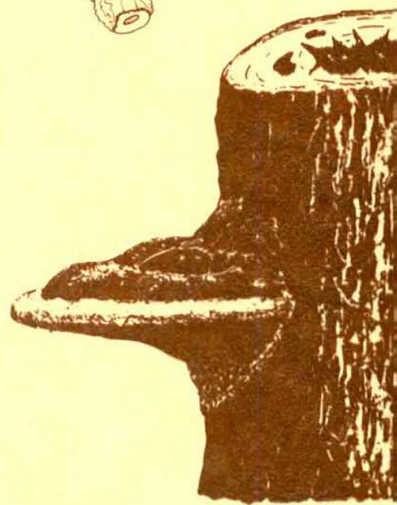
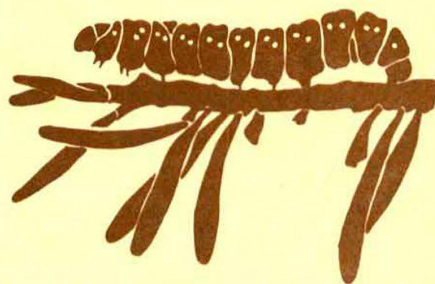
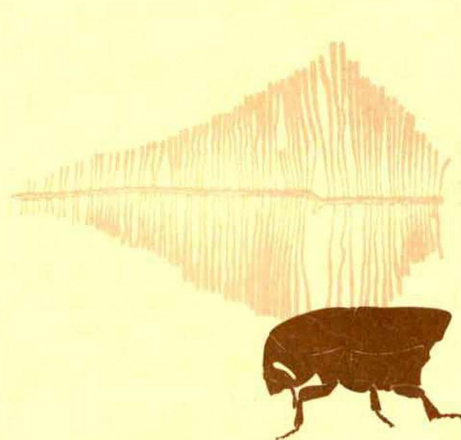


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REPORT



EVALUATION OF DOUGLAS-FIR BEETLE INFESTATIONS

PEND OREILLE LAKE SUPERVISORY AREA

1987

by

R. Ladd Livingston, Entomologist
Idaho Department of Lands
P.O. Box 670
Coeur d'Alene, Idaho 83814

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EVALUATION OF DOUGLAS-FIR BEETLE INFESTATIONS

PEND OREILLE LAKE SUPERVISORY AREA

INTRODUCTION

At the request of Larry Fryberg, Forest Area Manager, and at the suggestion of Winston Wiggins, Supervisor-Timber Sales, I visited the Pend Oreille Lake Supervisory Area on September 15-18, 1987, to help evaluate an outbreak of the Douglas-fir beetle, Dendroctonus pseudotsugae Hopkins. During the visit Larry and I visited or discussed twelve locations, evaluating green stand conditions for risk and hazard of attack, attacked stands for general beetle activity level, current and past beetle populations and the potential for use of trap trees and/or pheromones to contain the beetle populations, thus providing more time for timber management activity. Scott Bacon, Fire Warden for Kootenai Valley, accompanied us in the Shilo area.

On September 2, 1987, I flew with Larry Fryberg by helicopter to view the same areas. On September 28 Larry and I made ground observations in the Hoo Doo area.

As a result of these surveys, I feel that there is a very high priority need for both immediate salvage of the dead and currently infested trees and for accelerated harvest of the high risk Douglas-fir stands. These stands are at a high hazard of being attacked by the Douglas-fir beetle either in the immediate future or at a later time when stimulated by winter damage, windthrow, or some other catastrophe. This action is needed to avoid immediate losses of the dead and dying trees and future losses due to the high potential of attack in the high risk stands.

OBSERVATIONS

1. Fox Creek and North Fork of Big Creek

The upper end of Fox Creek has many mortality centers. The attacked trees include older dead trees with no needles, 1986 attacked faders (currently with red foliage) that the beetles are gone out of, and new faders (1987 attacks) that are just beginning to turn color (yellowish green).

In the Foxy Bug Salvage Sale area, we generally found the attacks in typically large, older trees. There are adjacent stands of susceptible trees in the area that will undoubtedly serve as bait for next year's attacks. We also observed pockets of younger-aged, smaller trees scattered throughout the sale area. The timber marking for the salvage sale appeared to be very thorough. At all sites, the marking had captured all attacked trees, including the 1987 attacks where the trees were just beginning to fade.

The north fork of Big Creek has a few, small Douglas-fir beetle mortality groups. Groups were seen on both the north and south sides of the creek.

Heavier activity was seen on the north side here at the upper end. Overall, beetle activity is at a lower level in this area than in the Fox Creek drainage.

In the Big Creek area, there are three isolated stands of Douglas-fir. As noted, beetle activity is present but, at the moment, is not as heavy as in adjacent sites. These stands are high risk in that they are nearly pure to Douglas-fir and are composed of large, old trees. The potential hazard is also high due to the presence of beetle populations in and around the stands.

2. Johnny Long Mountain

4-D Sale Area: This area has a dead tree group of approximately 25-30 trees. They are adjacent to the previous sale, and it appears that they could be salvaged fairly easily.

Trader West Sale Area: We saw some dead trees that appeared to be available for salvage.

3. Blue Creek Basin

We observed dead tree groups scattered around the perimeter of the entire basin formed by Blue Creek and its tributaries. These are located primarily on the upper slopes in a band of susceptible Douglas-fir that circles the entire area. From the air and from our vantage point on Johnny Long Mountain, it appeared that there is a good species mix for most of this drainage basin. A large portion of the susceptible Douglas-fir may have already been attacked. This idea was confirmed to some degree by our ground observations at the "Blue Lake - Beaver Slide" area, which is discussed next in this report. Further ground surveys of this area are needed.

Currently, there are very few roads in this area. Because of this, there does not seem to be much opportunity for trap trees or pheromone bait trees in most of the susceptible host that does remain.

4. Blue Lake Beaver Slide

This is a small portion of the Blue Creek Basin area located in parts of Sections 24 and 25, T57N, R4W. In this area we found many 1986 attacks in large, old growth Douglas-fir. A high percentage of the susceptible stand has been attacked. We found very few 1987 attacks.

5. Old Blue Lake Timber Sale

In this area there are at least five beetle mortality groups. For the most part these groups are on steep, very rocky ground. There appears to be more susceptible host high on the ridge but there are no roads at the present.

6. Shilo

In Sale Unit 8 and adjacent land below the road, we found three newly (1987) attacked trees just outside the south edge of the clearcut unit. We saw very little beetle activity in the stand below the road from Five Corners into the Unit 8 area. This stand has a good species mix, and while there are some pockets of Douglas-fir, as a whole, it seems to be in a low hazard, low risk category.

To the north and east of Unit 8, in the next drainage, we saw a large group of dead trees and, from the air, it appeared that much of the adjacent stand is composed of susceptible old growth Douglas-fir. A sale is planned for this area but a road will have to be built through difficult terrain.

Jay Peak (North Side): In this area we saw a fair amount of white pine mortality. It appeared to be primarily due to blister rust.

7. Dennick Creek (South of the "Key of the Mountain")

On the Dennick Lake side we found a highly susceptible, high risk stand. There are current, 1986 attacked faders, 1987 attacked trees and adjacent stands of high risk green trees. According to Scott Bacon, this stand continues for approximately three-quarters mile along the ridge. There is a road system into the bottom side of this stand and other roads could be extended to access the top portions. There appears to be a good opportunity to use trap trees and pheromone baits in this area.

8. Sand Lake

On the Sand Lake side of the drainage (the north side of Dennick Creek) the stands appear to have a high volume of susceptible Douglas-fir. Looking across the canyon to the dryer, west-facing slopes, the stands appeared to have a high percentage of Douglas-fir with scattered, old growth ponderosa pine mixed throughout. Scott Bacon has walked through this area and recalls seeing a substantial amount of old-growth Douglas-fir throughout the stand.

9. Elmira Peak

From the air we saw three large beetle mortality centers on the southern exposures of the mountain. Other centers were seen on the west-facing slopes in the basin created by the drainages leading into McArthur Lake. On the ground we examined the stands on the south side of Elmira Peak. Here we found several stands of big, old, and highly susceptible Douglas-fir. Beetle attacks from both 1986 and 1987 were present. Higher up the hill the host changed, having patches of non-susceptible, size and density, trees. From vantage points on the ridge, it appears that the west-facing basin has a high percentage of susceptible, high risk trees.

10. Center Ridge (Mike's Bugs) - Between Happy Fork Creek and Big Creeks

The stand at this site is mixed (Douglas-fir, grand fir, western larch, ponderosa pine, and western white pine) on the upper portion of the area with a higher percent of Douglas-fir on the steep, south-facing slope. All species are old growth and over mature. The grand fir has Indian paint heart rot. There is scattered mortality of the Douglas-fir in the upper area with some mortality centers of 5-10 dead trees on the steep slopes. There is also scattered grand fir mortality. The upper area is low risk relative to the Douglas-fir.

With the existing road system providing close access, this area appears to offer a good opportunity for a trap tree/pheromone bait effort.

11. Saddler Creek Sale

This unit is south of Newport Hill, northwest of the town of Priest River. From the air we saw several large, 1986 attacked, dead tree groups. The beetle activity is mainly on the southwest-facing slopes of the ridge, just south of Newport Hill. We did not walk into the attacked stands on the ground but viewed the beetle activity from a distance. Larry indicated that a large portion of the forest on both sides of the ridge contain stands of high risk, high hazard Douglas-fir. With the existing and planned road systems, this area should provide good opportunity for pheromone attractant or trap tree work.

12. Hoo Doo Mountain

We found considerable Douglas-fir beetle activity in the upper end of Hoo Doo Creek. There are two major activity spots just outside of the sale area for the old Hoo Doo II sale. The upper spot is larger containing an estimated 75 dead trees. In our ground survey, we found that the old growth Douglas-fir is restricted primarily to strips up and down the small ridges in the area. Most of the area has mixed stands composed of grand fir and other species. There is only an occasional small group or single tree of Douglas-fir in these mixed stands. One site did have a higher percentage of Douglas-fir that warrants close monitoring. This was the old growth stand found along the road immediately prior to our arrival back to the vehicle.

Douglas-fir
beetle
mortality
group on
Hoo Doo
Mountain



Both from the air and from the ground, we saw four or five other smaller Douglas-fir beetle activity sites down the ridge on the west side of Hoo Doo Creek. Several of these appeared to be associated with root rot centers. With the existing road system and the presence of old growth stands of Douglas-fir, this site will provide good opportunities for trap tree/pheromone bait activity.

13. Gold Cup Mountain

This area was only observed from the air. One major Douglas-fir beetle mortality center was seen on the state ownership. It also appears that there are green stand of mature, old growth Douglas-fir in the area that need consideration for harvest activity. We also saw beetle activity further up the slope on private ownership. These beetles can serve as a population source for further problems in the area.

DISCUSSION

The Douglas-fir beetle outbreak currently present in the Pend Oreille Lake administrative area appears to have resulted from a population buildup in windthrown and snow-damaged trees that occurred in the winter of 1984-1985. This damage was widely scattered throughout northern Idaho. Many small, three to ten inch, and some larger trees were knocked over providing a large increase of food available to the beetles. The populations increased dramatically and the beetles attacked high numbers of large, old growth Douglas-fir trees in the spring of 1986. These trees faded in color, turning bright reddish-orange in the early spring of 1987. A new population of beetles also emerged to attack green trees at that time. The success of the 1986 and 1987 populations was enhanced by early, warmer than normal spring weather. The correlation between the incidence of winter damaged trees, with subsequent buildup of the beetle populations was very evident during our survey as we found old Douglas-fir windthrow present in or immediately adjacent to nearly every mortality center that we visited.

The new (1987) attacks were mainly found in trees adjacent to the 1986 mortality centers. Other, more distant centers undoubtedly also exist and need to be watched for. In our survey we found mature, adult beetles present in the 1987 attacked trees. These trees were just beginning to lose their color, having faded to a light, yellowish-green color by our mid September survey. These beetles will overwinter in the adult stage, emerging early next spring to make new attacks. Their success will depend mainly on the availability of susceptible host trees. This will be determined, at least in part, by the spring weather conditions of 1988. If we have another early warm, dry spring, it will contribute to the beetles' success. Also, if there is more winter damage, the beetle populations will again gain in momentum.

Under normal conditions, my observations have shown that Douglas-fir bark beetle populations persist at low levels in root rot trees and low level windthrow. Outbreaks occur when there is some sudden catastrophic action, such as windthrow or winter damage or extreme defoliation by budworm or tussock

moth. Once an outbreak starts, it persists for two or three years in the same general locations, then usually declines back to the lower levels. This is the pattern that we have seen to date with the current outbreak.

Unless we experience additional contributing conditions, as described above, I expect that there will be fewer new attacks in 1988. However, since we have an abundance of high risk Douglas-fir (large, old trees in relatively pure, dense stands) and a high hazard or potential for attack of these trees due to the existing beetle population, I do not think we should postpone scheduling these stands for harvest. To avoid future losses we should accelerate cutting of these stands as rapidly as possible. Within the Pend Oreille Lake Area, there is more potential for insect damage by the Douglas-fir beetle in these old growth Douglas-fir stands than by any other insect on any other host tree.

Principal management options include:

1. Salvage of old attacks and currently attacked trees.
2. Accelerated harvest of susceptible stands using a risk rating to help establish priorities for individual stands.
3. Use of trap trees and/or pheromone baits to contain the beetles to help provide more time for timber management activity at a particular site or stand. Trap trees are suggested at the following numbers:
 - a) Large infestations (> 25 trees); 1 trap tree / 2 attacked trees
 - b) Small infestations (< 25 trees); 1 trap tree / 4-5 attacked trees

In north Idaho the most susceptible stands generally have the following characteristics:

1. Stand age averaging 120 years or older although in some outbreaks green trees down to about 80 years old have been attacked.
2. Average tree size of 18" DBH or greater
3. Stand density. Higher risk in stands of 80-125 percent of normal stocking.
4. Stand species composition and habitat type:
 - a) species purity: the greater the % DF, the greater the risk
 - b) habitat type: high risk = grand fir / pachistima
= western red cedar / pachistima

RECOMMENDATIONS

The following recommendations are relative to management of the Douglas-fir bark beetle outbreak. This includes an evaluation of the immediately past and existing beetle populations, the general amount of existing high risk Douglas-fir at the sites, and the apparent ease of timber and beetle management activity due to the presence or absence of a road system. The recommendations are grouped into divisions of high, medium and low priority. Within each group the respective stands are listed in my order of priority.

HIGH PRIORITY

The stands in the "High Priority" group all have beetles present, dead or infested trees needing immediate salvage and high hazard, green, old growth stands that need accelerated harvesting to avoid future beetle mortality. These stands also have road access already in place or planned and, in some instances, located on the ground. Relatively little developmental work will be needed to have these stands under management.

1. Fox Creek and North Fork of Big Creek

Continue the planned salvage sale. If possible include the mortality centers in the Big Creek portion of the area.

High priority for accelerated harvest of green stands, especially in the stands in the North Fork of Big Creek.

Excellent opportunity for trap tree / pheromone containment.

2. Dennick Creek

High priority for accelerated harvest of green stands.

Extend planned salvage into newly found mortalities if possible.

Very good opportunity for trap tree / pheromone containment.

3. Saddler Creek

High priority for accelerated harvest of green stands. Continue plans that have already been initiated.

Low chance for immediate salvage of mortality centers due to lack of access.

Some opportunity for trap tree / pheromone containment especially in conjunction with new road building in the spring of 1988.

MEDIUM PRIORITY

These acres are put into the "Medium Priority" group solely on the basis of the lack of ease of immediate action. New road development is needed to access these stands both for salvage purposes and accelerated harvest of the green stands. Immediate attention needs to be given to the question of extra funding to allow this road development. The need for salvage of dead and infested trees and accelerated harvest of the green stands is as high for these stands as for those in the "High Priority" group.

1. Elmira

High Priority for accelerated harvest of green stands.

Low opportunity for immediate salvage due to road building needs.

Relatively low opportunity for trap tree / Pheromone containment due to lack of access. This site may be a good area to test some of the new pheromone / beetle management theories, i.e. the use of funnel traps with MCH anti-aggregating pheromone bubble caps on adjacent trees to prevent attack of these trees by the beetles attracted to the pheromone baits of the trap.

2. Johnny Long Mountain - Blue Creek Basin

High priority for accelerated harvest of green stands.

Low chance for immediate salvage due to lack of current access.

Low opportunity for trap tree / pheromone containment due to very limited access.

3. Shilo Basin North (Area Beyond Unit 8)

High priority for accelerated harvest of green stands.

Low chance for immediate salvage. Road construction is needed.

Low opportunity for trap tree / pheromone work except as may be done in conjunction with road construction.

4. Sand Creek (Jay Peak - South Side)

High priority for accelerated harvest of green stands.

Low opportunity for immediate salvage due to lack of an existing road system.

No opportunity for trap tree / pheromone containment.

5. Gold Cup Mountain

There appears to be a need for accelerated harvest of the green stands but additional ground surveys need to be conducted to determine the priority.

6. Center Ridge (Mike's Bugs)

Medium priority for accelerated harvest of green stands.

Good opportunity for immediate partial salvage. Balance would require new road development.

Very good opportunity for trap tree / pheromone containment.

LOW PRIORITY

Generally these are low priority due to having low hazard stands. There is generally a good mix of species, or the remaining Douglas-fir are smaller or not as dense. The one exception is the Old Blue Lake Timber Sale area.

1. Old Blue Lake Timber Sale

Medium to low priority for accelerated harvest of green stand due to very difficult development of access. High hazard stands are present in the area, however, and should be harvested if possible.

Low chance of salvage.

Low opportunity for trap tree / pheromone work.

2. Blue Lake Beaver Slide

Medium to low priority for accelerated harvest of green stands.

Good opportunity for at least partial salvage. Some road construction will be necessary to cover all of the area.

Medium to low opportunity for trap tree / pheromone work.

3. Shilo (Area below road leading to Unit 8)

Low priority for accelerated harvest of green stands.

Little need for salvage except near the "5 Corners" site.

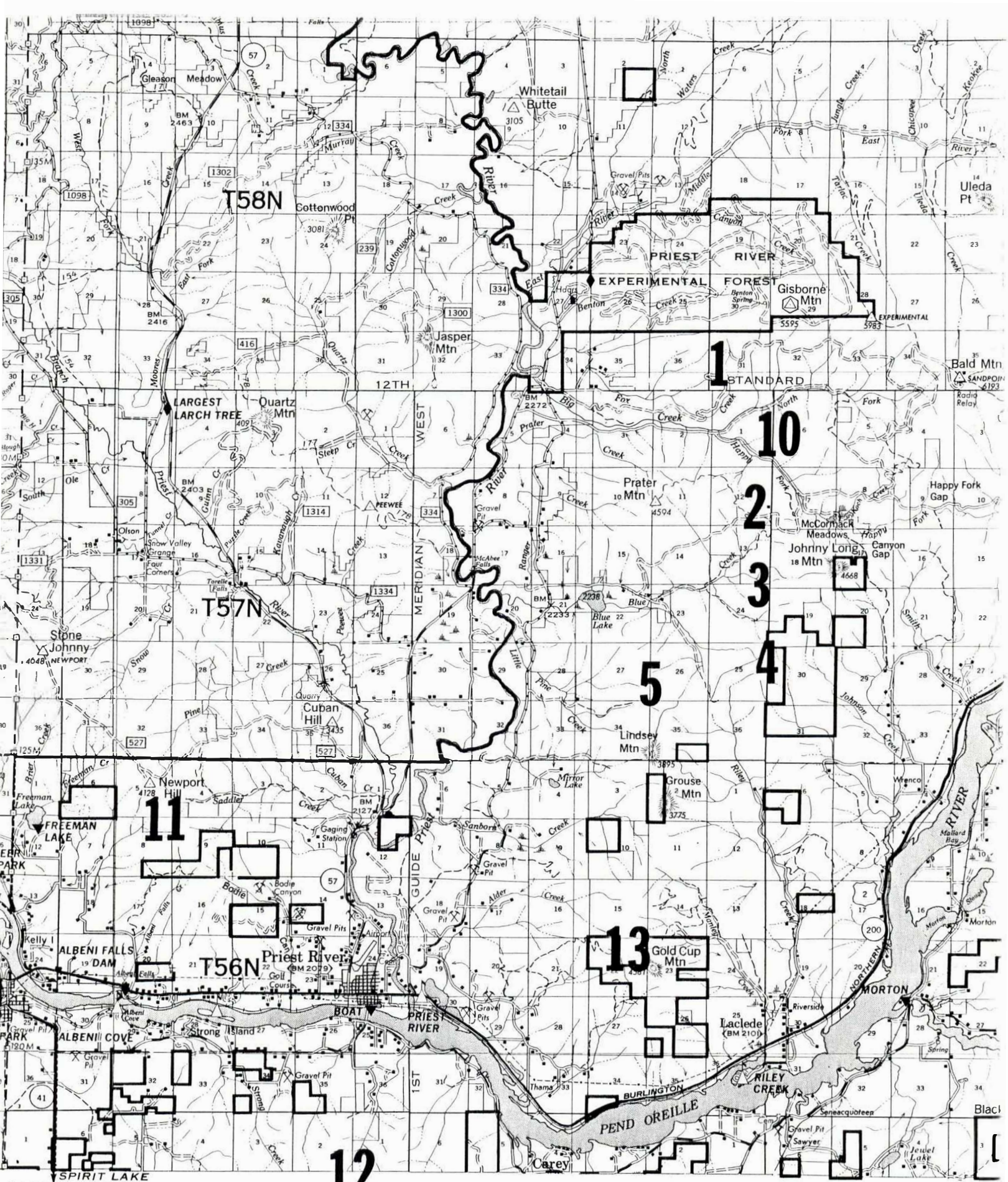
Low opportunity for trap tree / pheromone work. Some could be done in the scattered patches of susceptible host along the road.

4. Hoo Doo

Low priority for accelerated harvest of green stands. Good mix of species exists in most of the area.

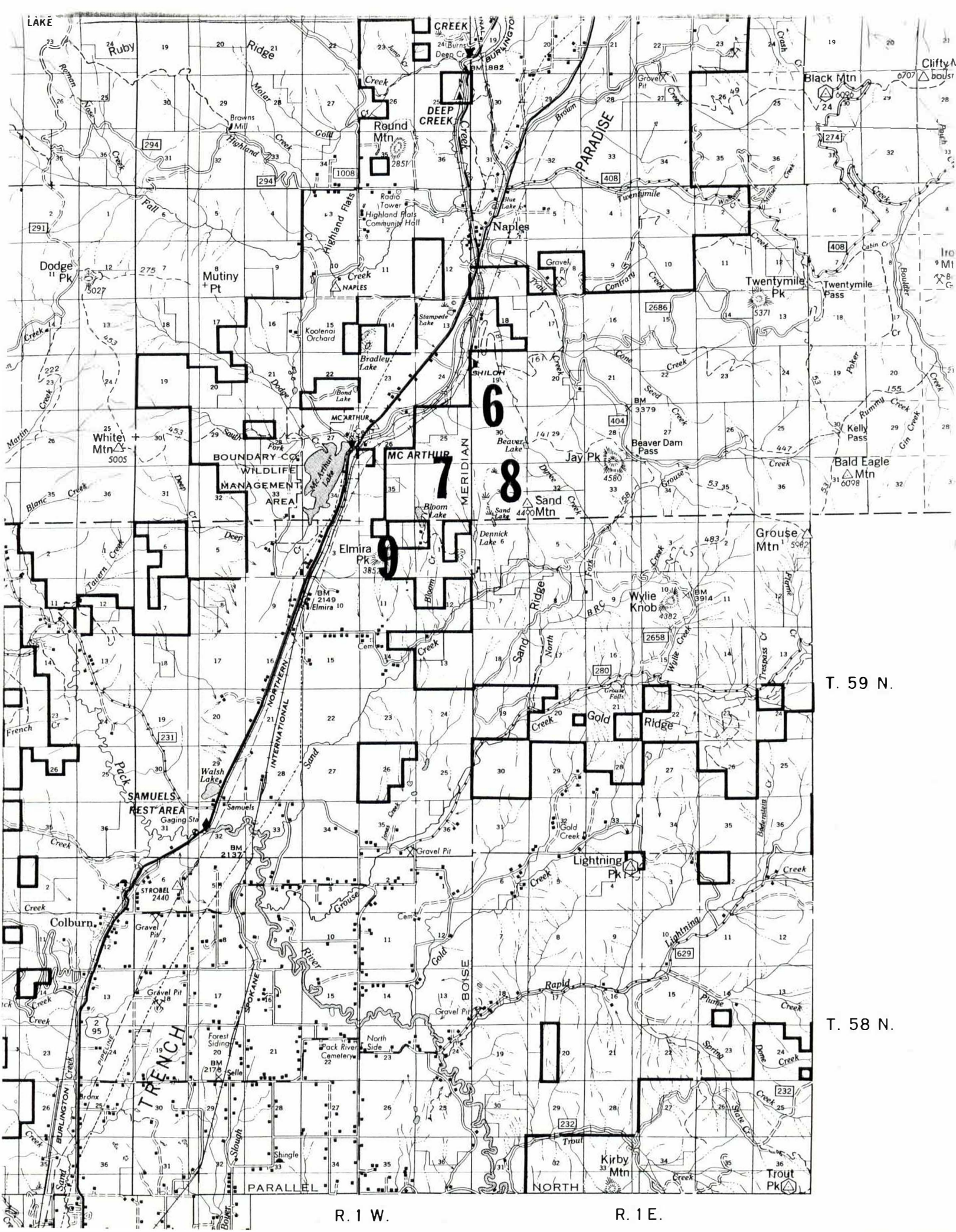
Immediate salvage advisable using the planned but currently undeveloped road system.

Good opportunity for some trap tree / pheromone containment.



R. 6 W. R. 5 W. R. 4 W. R. 3 W.





T. 59 N.

T. 58 N.

R. 1 W.

R. 1 E.

